UNIVERSITY OF GONDAR,FACULTY OF VETERINARY MEDICINE

DEPARTMENT OF ANIMAL PRODUCTION AND EXTENSION

THE EFFECT OF MILKING PRACTICE AND MILKING FREQUENCY ON MILK YIELD IN CASE OF UOG DAIRY FARM

SENIOR RESEARCH PROJECT REPORT

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SENIOR RESEARCH PROJECT SUBMITTED TO DEPARTMENT OF ANIMAL PRODUCTION AND EXTENSION,IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR BACHELOR OF SCIENCE DEGREE IN ANIMAL PRODUCTION AND EXTENSION

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List of Aabbreviations

UOG	university of Gondar
CSA	central statistics Agency
FAO	Food and Agriculture Organization
ID	Identification card

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Abstract

The study was carried on University of Gondar dairy farm from march 2015 to may 2015. Gondar University dairy farm is found in Gondar town, the major objective of these study was to assess the effect of milking practice and milking frequency on milk yield and also identify the milking practice problem of Gondar dairy farm. From total of 29 lactating cows 16 are high milk producer cow and 13 are low milk producer cows group. We were selected 5 cows randomly from each group and milked twice and three times a day. Interviewed with pre-tested structured questionnaire to obtain information on the milking condition, milking frequency, milking order, milk let down, milk let down stimulation, inhibition of milk letdown , milking speed and milking interval of cows in UOG dairy farm. A follow up study was also conducted to obtain milk production based on milking frequency and milking speed. The follow up study showed that the mean daily milk yield for the three times milking and twice milking was 12.5 and 9.9 liters respectively. The milk yield was decreased significantly in twice milking than three times milking ($p<0.0001$). The milk yield was observed significantly ($p<0.005$) higher in high milk producer cows than low milk producer cows for three times milking per day. From the survey results, the mean milk production of high milk producing cow and low milk producing cow was15.9 and 6.5 respectively. The present study showed that the milk production of the farm was at certain level. Thus, there is a need to proper management of cows during milking and employee of good milkier in order to increase the milk yield.

Key words: milk yield, milking frequency, milking practice,

1. Introduction

The world population obtain most of its milk and milk products from cows, water buffalo, goats, and sheep, horses, donkey, rein-deer, yaks, camel and sows contribute a small to the total milk supply. Milk with its well balanced assortment of nutrients, is sometimes called natures most nearly perfect food (Thomas, 2003).While milk is an excellent food product in many ways, it is not perfect, nor is any other food. Milk and numerous milk products example, cheese, butter, ice cream and cottage cheese are major components of the human diet in many countries. Changes in dietary preferences and milk marking are some of the challenges facing the dairy industry (Thomas, 2003). Compared to other countries in Africa, Ethiopia consumes less dairy products. Per capita consumption of milk in Ethiopia is as low as 17 Kg per head while the average figure for Africa is 26 Kg per head (Gebrewold etal, 1998).cows represent the largest cattle population in Ethiopia. According to the food and Agriculture organization (FAO, 1990)42% of the total cattle heads for the private holding are milking cows. Milk produced from about 10 million milking cows is estimated at about 3.2 billion litters, an average of 1.54 liters per cow per day over a lactation period of about 6 months (CSA, 2008).The average amount of milk produced per person per year in developing tropical countries is 37 litters compared with 300 liters in developed countries (FAO, 1995).Milk is the basic product of dairy industry. The secretion of large amount of high quality milk is the basic purpose of modern dairy caw. Milk is secreted by, stored in gland removed from the udder, or mammary glands of dairy cows and other mammals. The removal of large amount of high quality milk from the udder of dairy cow with a minimum damage to the udder is the single most important job of dairy men. Improper or careless milking practice can result in decreased let dawn, increase incidence of under disease, decreased milk quality and ultimately decreased productivity and profitability (Paul and William, 1978). To achieve the goal of the milking program requires a basic understanding of the anatomy and physiology of the bovine under, the process and control of milk synthesis and milk let down, and the function of milking machines. It also requires through knowledge of managed milking practices that result in maximum let down of a high quality product with minimum udder damage (Paul and William 1978). Milk is the only food of the young mammal during the first period of its life. The substances in milk provide both energy and the building materials for growth. Milk also contains antibodies which protect the young mammal against infection. A calf needs about 1000 litters of milk for growth and that is the quantity which the per calf a cow produces for each calf. Selective breeding has resulted in dairy cows which yield more than 5000 litters of milk per calf that is five time as much as the primitive cow (Ramakant et al, 2006).

1.2 Statement of the problem

Quality and quantity of feeds provided to cows remained constant; milk production can be improved by improving the milking practice i.e. speed of milking, reducing noise and other disturbance at milking, and by increasing the frequency of milking. Do the workers in university of Gondar dairy farm know it? .if they know do they practicing it? Are the key questions aimed to answer in this research? We select this issue because it did not address by any researcher here before. It is known that the milk produced at UOG farm at present is not enough to customers. The reason mostly ascribed is feed shortage. Do they checked and used all other options to increase the milk production nobody knows. Thus this research tries to search out and disclosed this issue.

1.3 Objective

1.3.1 General Objective

The overall objective of the study is to assess the effect of milking practice and milking frequency on milk yield in university of Gondar dairy farm by taking causes which have the same breed, the same feed and by making all management practice the same.

1.3.2 Specific objective

- ✓ To assess if there is any room of increasing milk yield by improving milking time speed of milking condition in UOG farm.
- ✓ To assess if there is any room of increasing milk yield by increasing milking frequency
- ✓ To assess the problems of milking practice UOG dairy farm.

1.4 Significance of the study

By using the result of this research i.e. by identifying and correcting fault milking practice university of Gondar dairy farm can increase milk yield without any additional cost. Other farms in Gondar and around can copy the experience of university of Gondar.

2. Literature Review

2.1 The effect of milking frequency on milk yield

Milking cows three times per day will increase total milk production from 6 to 20 percent as compared to two times per day milking (James, 2003). Milk fat percent will decease slightly. Some costs will increase with three times per day milking there appears to be little effect on herd health. Various studies indicate that an increase of 8 to 10 percent in milk production is needed for three times per day milking to be profitable. A dairy farmer who is considering three times per day milking will need to carefully evaluate the effect on the individual operation before making a final decision. A major cost when milking three times per day is labor. Some dairy farmer's milk three times per day in the winter and two times per day when field work increases. Research show that greatly increases production from three times per day milking comes during the later stages of lactation. Therefore, it is generally recommended that three times per day milking be continued for the entire lactation period (James, 2003).

It is commonly believed that substantial increase in milk yield will be obtained if caws are milked three times daily, instead of twice. Care must be taken with these claims as some of the information on three times per day milking has come from studies of milk recording information. In these case, individual farmers have selected which cows will be milked three times per day, and it is not unreasonable to believe that farmers select the caws which are the highest producers to milk three times, while the lower producers are only milked twice per day. Differences of 15 to 40 percent in favor of three times per day milking over twice per day have been reported (FalveyL; and Chantalakhana, 1999). When direct experiments have been carried out the difference in favor of three times per day milking has been between five percent and 15 percent four times a day milking gives a small increase over three times per day from the perspective of reducing labor involved in milking, there has been some interest in reducing the number of milking. However, it appears that milking once per day for the whole lactation reduces yields by about 40 to 50 percent. Similarly, milking thirteen times per week instead of fourteen for the whole of the lactation has been found to reduce yields by 5 to 10 percent (Falvey and Chantalakhana, 1999).

In the previous study (Kellick *et a*l, 1997) reported that milk yield increased by up to 10.4% in caws milked three times per day compared to those milked twice per day.

Similarly, (Stelwagen, 2001) showed that milking three times daily increased milk yield in caws by up to 18%. In another study, (Ostermans and Bertilsson, 2003) showed that the yield of energy corrected milk was higher in cows milked three times per day compared to those milked twice per day. And other study (Sirohi *et al*, 2012) affirmed that milking three times per day rather than twice increased milk yield in cross breed cows but at the cost of their body condition. The higher milk yield in cows milked secretion is a continuous process resulting in gradual elevation of internal udder pressure and consequently stimulate milk secreting cells to operate at full capacity for longer time.

2.2 The effect of milking practice on milk yield

2.2.1 Recommended milking practice

Follow a regular routine, dairy cows respond with higher production when milked regularly at about the same times each day. Milking interval (time between milking) should be about equal. The day time interval can be somewhat shorter than the night interval.

Practice the cow for milking, pre-wash extremely dirty udders with a hose or bucket of warm water containing a detergent then wash the udder with warm water containing a sanitizing agent such as chlorine or iodine, Use as trip cup milk two or three of units of milk from each quarter in to the strip cup. This stimulates milk let-down. It also removes the first milk .Attach the milking machine within one minute after stimulating milk let dawn be gentle when attaching the teat cup, Remove the milking machine gently, Dip the teats after milking use a solution made for teat dying. Do not use sanitizer made for other purpose solution containing to be the most effective. The use of a teat dig will help reduce mastitis is infection. It is not a cure for existing infection, Milkier hand must be clean wash before starting to milk and after handling any infected cows, Do not try to operate too many units. This will result in over milking and can cause udder damage, Milking order milking heifers, cows in early lactation and normal caws first,cows with udder infection are milked last source (James, 2003).

2.2.2. Milking of cow and its care

Time of milking: should be at regular interval every day, the interval should be as equal as possible. Abrupt change in the time of milking affects total yield (Getachew, 2006).

Cows milked twice daily at 10 and 14 hour interval produce about 1% less milk on average than cows milked at 12 and 12 hour interval. Higher producing cows may show a greater inhibition in milk yield. Law producing cows milked at 16 and 8 hour interval produce only 1.3% less milk than similar cows milked at 12 and 12 hour interval, but milk production losses of 4 to 7% occur in higher producing cows and in heifers (Donald L.etal,1985).

Dairy men milking 80 to 200 ungrouped cows in a milking par or may milk individual cows at markedly unequal interval from day to day. However, by grouping cows according to milk yield or physiological state, higher producing cows and heifers can be milked close to a 12 and 12 hour interval (Donald L. et al, 1985).the effect of un equal milking interval indicates that cows milked at either 9 and 15 hours or 8 and 16 hour interval produce 1 to 3 percent less milk per lactation than cows milked at equal interval (G.C., Banerjee,1998).

2.2.3. Milking order

A desirable milking order in a herd is the following sequence Heifers cows that have been free of mastitis. First, old cows that have been free from mastitis second, cows that have been a previous history of mastitis but do not show symptoms now, third and cows which quarters producing abnormal milk should be milked last(G.C.,Banerjee,1998).

2.2.4 Preparing the cow , milkier and other management during milking

Cows should not be excited before milking the udder and teats should be washed with antiseptic lotion or boiled neem tree leaves, then dry the udder with cloth. Milkers having filthy habit that is spitting, blowing nose even talking should be cautioned (Getachew, 2006).

A good milkier is one who likes cows and is gentle with them. He or she is a highly skilled worker, rapid, efficient, gentle and clean. A good milkier can recognize abnormal conditions of the teats and udder by sight and feel, and can move about the caw gently and quietly to avoid making her nervous

and afraid. A good milkier also knows the operation details of the machinery and is able to maintain it in peak operating condition. Such a person also knows the essentials of a good managed milking program and follows them to get the job done properly and efficiently (William and Paul, 1978).

After each milking first; wash equipments with warm water then, scrub and rinse with clean cold water, after wards, the utensils are placed in racks up side dawn until neat milking. While milking all effect to be made, if necessary by assistant, to keep the milking cows undisturbed by flies. Unnecessary noise or any other acts which draw sudden attention of cows should be avoided. Feeding make the animal busy at time of milking if repeated, by in self, induce the production of oxytocin (Getachew, 2006).

2.2.5 Factors reduce amount of milk harvest from the cows with the same genetic makeup and feeding situation

Milk ejection can be inhibited even through the cow has been properly stimulated. It is often said that a cow “holds up her milk”. It is impossible for a cow to “hold up her milk”. The inhibition is involuntary and cased by the release of another hormone, adrenaline often called the “fear” or fright hormone. Release of this hormone is also the result of nervous stimulation such as rough treatment of the cow, loud noises, pain, irritation, slow milking, distorted time of milking. Continual over milking can be irritating and painful to the cow and can result in the cow’s anticipation of pain, which may cause the release of adrenaline. The action of adrenaline can neutralize the effect of oxytocin by constricting blood vessels, which reduces blood flow and oxytocin presence in the udder (William and Paul, 1978).

2.3. Milk let down

Milk let down or milk ejection reflex is controlled by hormones and it is an involuntary action on the part of the cow. A small amount of milk present in cisterns and large ducts of the udder can be removed merely by overcoming resistance of the sphincter muscle surrounding the streak canal of the teat. However, the major portion of milk present in the udder must be forced from the alveoli and small milk ducts by the activation of an environmental reflex called milk ejection or milk “let-down”. The milk ejection reflex involves activation of nervous in the skin of the teat which are sensitive touch or temperature (G.C., Banerjee, 1998).

2.3.1 Milk let down stimulation

Milk let down or milk ejection is initiated by a stimulus such as washing of the udder, manipulation of the teat, the nursing of calf noises associated with milking, feeding cows, presence of the milkier and also the release of oxytocin(G.C.,Banerjee,1998).the milk let down can be associated with feeding the cows or washing of the udder(Thomas, and Robert,2012).milk let down occurs when the cow responds by a conditioned reflex to sensory stimuli such as the washing of the udder ,gentle washing of the udder helps stimulate milk let down(James R.,2003).

2.3.2 Milk let down process

The stimuli cause a nerve impulse travel via the different sensory nerve to the spinal cord and then to brain. The brain causes the release of the hormone oxytocin from the posterior pituitary gland in to the blood system, and then reaches to the mammary gland. The hormone causes contradiction of the myoepithelial cells (that surround the alveoli and ducts) and results milk ejection (Falvey and Chantalakhana, 1999).

2.3.3 Inhibition of milk letdown

The milk ejection reflex can be inhibited also when this occurs, only a small portion of milk can be removed from the udder, external unpleasant event milking may cause sympathetic nerves to release epinephrine from the adrenal medulla in to blood. This inhibition of milk let down is involuntary and caused by the release of Adrenaline/ which is involuntary action for the cow. The release of adrenaline is also a result of nervous stimulation such as rough treatment of the cow, loud noise, any pain or irritation on animal. Continual over milking can be irritating and painful that causes the release of adrenaline and also excitement, stress, will interrupt the let down process the hormone adrenaline is released from the adrenal cortex when the cow experiences any uncomfortable situation. Adrenaline completely blocks the action of oxytocin. Therefore, it is not possible to achieve high yields of milk if the cow is milked in a situation where it is likely to be frightened stressed, hurt or excited and other factor (Faluey and Chantalakhana, 1999).milk let down is inhibited by frightening or hitting the cow will create an emotional disturbance that release the hormone adrenaline, causing it to interfere with the milk let down process (James R., 2003).

3. Material and Methods

3.1 Study area description

Gondar university dairy farm is found in Gondar town located 740 km North West of Addis Ababa. The weather condition of the area is semiarid climate having an annual minimum and maximum temperature and mean rainfall varying 12.3 and 30^0C and 1000 mm respectively. The area is found at an attitude, longitude and latitude 2200m, 35.3-35.7 ^{0}E and 12.3-130^{0}N respectively.

The months from October to April are dry period while June to August is rainy (Yenus, 2010).

Gondar university dairy farm has 104 heads of animals which includes 54 cows, 13 Heifers, 34 calves and 2 bulls.

3.2 Data collection and sampling technique

3.2.1.Type of data

Data was used both qualitative and quantitative type of data's.

3.2.2. Sampling technique

In UOG there are 29 lactating cows these lactating cows were groped in to two based on their milk production. Cows those which produce less than 8litter/day were grouped under low milk producer category and those cows which produce greater than 8 litter /day were grouped under high milk producer. From each group 5 cows were selected randomelly by lottery method and also their twice /day and three times /day milk product were recorded. The mean difference between twice /day and three times/day milk yield were compared. The mean milk yield in twice /day milking were 12.5and 5.6 respectively for high and low producer cows. The mean milk yield in three times /day were found to be 15 and 7.2 respectively for high and low milk producer cow group. We were also found a significant difference between twice /day and three times /day milking in university of Gondar dairy farm.

3.2.3. Data Collection and analytical technique

Data was collected from both primary and secondary source. Primary data was collected through observation, making questioner and interview. Secondary data was collected from library books, research report and from internet.

Data on problems of milking practice would be collected to obtain information on the effect of milking speed, milking interval, milking condition and milking frequency on milk yield that was identified by the milkier. A follow up study also conducted to see practically the effect of milking frequency on milk yield, cows were milked twice and three times without changing feeding and other management practices. The mean yield between frequencies will be compared using appropriate statistical software. To assess the effect of milking time, milking speed and milking condition the lactating cows were milked with usual practice and other day the same cows were milked with adjusted milking time, condition, speed for adjusted milking time. The gap between milking were equal approximately twelve hours interval. To see the milk speed effect each cow were milked by different milkers and recording the time taken to milk the cow, then the milk speed and amount of milk produced were compared among the milkier.

4.Result and Discussion

4.1. Result

4.1.1 .The effect of milking frequency on milk yield

Milking frequency significantly affected the milk yield in this study. The highest milk yield was recorded in three times milking per day as compared to two times milking per day. The mean milk yield of three times per day is significantly different from two times milking per day mean milk yield.

Table 1 shows the mean milk yield of two times milking per day and the mean milk yield of three times per day.

Cow No:	Productivity	Milking frequency/day	Milk yield /day	Mean
1	Low	Twice	6	9.9
2	Low	Twice	6.5	
3	Low	Twice	5	
4	Low	Twice	5.5	
5	Low	Twice	5.5	
6	High	Twice	11	
7	High	Twice	13.5	
8	High	Twice	10.5	
9	High	Twice	22	
10	High	Twice	13.5	
11	Low	Three times	7.6	12.5
12	Low	Three times	8.3	
13	Low	Three times	6.4	
14	Low	Three times	7	
15	Low	Three times	7	
16	High	Three times	14	
17	High	Three times	17	
18	High	Three times	13	
19	High	Three times	28	
20	High	Three times	17	

The percentage increase of low producer cow in three times milking per day was 28%. The percentage increase of high producer cow in three times milking per day as compared to two times milking per day was 28.6%. The mean milk yield in two times per day milking were 14 and 5.7 respectively for high and low producer cows.

The three times milking per day mean milk yield was found to be 18 and 7.3 respectively for high and low producer cow. There was also found significant ($p<0.0001$) difference between three times and two times milking per day in UOG dairy farm. The milkier of the farm knows the effect of milking frequency on milk yield but they do not milk the cow three times per day because the milk which is milked in the night were clot and these is not required by the customer .before this time these practice was done. For these reason the farm milk the cow two times per day to satisfied the customer need, Because the UOG dairy farm should not lose their customer. In this study area milkier of the farm know the effect of milking frequency on milk yield but few milkier do not know the effect of milking frequency on milk yield.

In this study the result showed three time milking per day increase milk yield by 26% as compared to two times milking per day milking.

4.1.2 The effect of milking speed on milk yield

In UOG Dairy farm the milkier were grouped in to two based on their milking speed. This is fast milkier and slow milkier. The same cow were milked by slow and fast milkier and the mean milk yield of the cow that were milked by fast milkier and the slow milkier were recorded and analyzed by using independent sample t-test. According to the response get from the milkier they know the effect of milking speed on milk yield. The milkier said when milk the cow slowly the adrenaline horomon were produced and inhibited the milk secretion of the cow then the milk yield becomes reduced. So to prevent the adrenaline secretion they were milk the cow at rapid rate.

Table two: shows the mean milk yield variation between slow and fast milkier

Cow ID	Milking speed	Milking frequency/day	Milk yield/litters	Mean
HF-33	Slow	Three times	14	14
HF-01	Slow	Three times	14	
N36	Slow	Three times	14	
N31	Slow	Three times	15	
HF-33	Fast	Three times	16	16
HF-01	Fast	Three times	16	
N36	Fast	Three times	16	
N31	Fast	Three times	17	

There were significant variation on milk yield between slow milkier and fast milkier ($p < 0.0007$). The result showed that the milk yield was increased by 14.3% which was milked by fast milkier as compared to slow milkier, Because the fast milkier takes 7 minutes to completed milking but the slow milkier takes 9 minutes to completed milking. The result showed when milked the cow slowly the milk yield becomes reduced because the adrenaline hormone is secreted and milk stimulation remained for short period of time that is 7 to 8 minutes, so rapid milking is an important in obtaining maximum milk yield. According to the response of the milkier when milking the cow slowly the milk let down would be inhibited because the oxytocin release were inhibited by the adrenaline secretion. According to the response of the milkier the milk yield of the farm were vary from day to day.

Table 3 shows the cause of milk variation in UOG Gondar dairy farm from day to day

Factor	No, of respondent	Percentage
Brewery spine grain	14	100%
Mastitis	6	43%
Pregnancy	10	71%
Milkier experience	6	43%
Milking speed	8	57%
Corn	5	36%
Water	4	29%

As the table showed the most powerful factor that fluctuate milk yield from day to day were absence or present of brewery spin grain, milking speed, pregnancy, milkier experience and mastitis.

4.1.3 The milking interval in UOG

The study conducted on UOG Gondar dairy farm showed that the milkier was milk the cows at regular time every day ,that is at 8 ,O'clock at day time and at 9 O'clock local time at night time, because the milkier knows the effect of milking interval on milk yield and They milk the cow at 12- and 12 hour interval. According to the response of the milkier when the milking interval was not equal the cows irritated and the milk yield becomes reduced. According to the observation of study the milkier milk the cow on time that means they do not late, because they know the effect of milking interval on milk yield.

4.1.4 Milking order in this study area

According to the response of the milkier they follow the correct milking order because they know the effect of milking order on milk yield .when the milking order were vary the milking cow irritated and reduced their milk yield because irritating was one of the factor that inhibited milk letdown and when the milking order were not correct the mastitis was transmit from the diseased cow to the healthy one then the cow milk production were reduced and the cow would be die so the cow number reduced .when the cow number reduced the milk yield were reduced. According to the response of the milkier they milk the cow in this order, heifer cows that have been free of mastitis, old cows that have been free from mastitis, cows that have been aprevious history mastitis but do not show symptoms now and cows which quarters producing abnormal milk should be milked last.

4.1.5 Milking condition of dairy cow in UOG Dairy farm

According to the result of this study the UOG dairy farm milkier knows the effect of milking condition on milk yield. there are factors affecting milking condition in UOG dairy farm, such as loud noise, entering of person during milking, hitting the cow during milking, absence of feed during milking, change of milkier cloth color, continual over milking and improper stimulation of the cow during and before milking. These factors were inhibited the milk let down because the action of oxytocin were inhibited by the secretion of adrenalin hormone. the milkier knows the effect of this factors on milk yield, but during our observation some milkier hit the cow during milking, not properly washing the cow udder and they talk loudly during milking, they know the effect but they do not do practically.

The study showed that the milkier do not use any other milk let down stimulation they use only by washing with cold and feeding the cow during milking.

4.1.6 Factors that inhibit milking let down in UOG Dairy farm

According to the response of the milkier the milking condition of the cow were affected by absence of feed during milking ,loud noise ,color change of milkier clothe ,entering of person during milking, hitting the cow during milking.

4.2 Discussion

4.2.1 The effect of milking frequency on milk yield

Milking twice /day yields at least 40 percent more milk than once per day .but increasing milking frequency to three times per day increase milk yield by up to 20 % in range (5-20%). The increase is usually highest in first lactating cow and declines as the cow gets older. The result of this study was greater than the result reported by (kleiLR *etal,*1997) who reported that milk yield increased by up to 10.4% in cows milked three times per day compared to those milked twice per day. Similarly (stelwagenki, 2001) showed that milking three times daily increased milk yield by up to 18%. In other study (ostermans and bertilsson,2003) showed that the yield of energy corrected milk was higher in cows milked three times per day compared to those milked twice per day. Milking cows three times

per day will increase total milk yield from 6 to 20 percent as compared to two times per day milking(James,2003).it is commonly believed that substantial increase in milk yield will be obtained if cows are milked three times daily instead of twice.

Difference of 15 to 40 percent in favor of three times per day milking over twice per day have been reported (falveyL and chantalakhana,1999).When direct experiments have been between 5 and 15 percent. Four times per day milking gives a small increase over three times per day. From the perspective of reducing labor involved in milking, there has been some interest in reducing the number of milking. However, it appears that milking once per day for the whole lactation reduces yields by about 40 to50 percent (falvey and chanalakhana, 1999). The study conducted on UOG dairy farm also showed that three times milking per day had significant effect on milk yield. The result of this study showed that milking three times per day increased milk yield by 27%, This result was greater than the result reported by other. The result showed when the UOG Dairy farm milk the cow three times milking per day the milk yield increased by 27% but they did not milk the cow three times per day. So by not milking the cow three times per day the farm lose the milk yield that increased by 27% of the milk yield get from three times milking per day.

4.2.2. The effect of milking practice on milk yield

4.2.2.1. The effect of milking interval on milk yield

Time milking should be at interval every day; the interval should be as equal as possible. Abrupt change in the time of milking affects total milk yield (Getachew, 2006). The result of the study conducted on UOG Gondar dairy farm also showed that the effect of milking interval on milk yield. cows milked twice daily at 10-and14 hour interval produce about 1% less milk on average than cows milked at 12-and 12 hour interval (Donald L.etal,1985). According to the result of this study the milkier knows the effect of milking interval on milk yield and they milk the cow at 12- and 12 hour interval. The effect of un equal milking interval indicates that cows milked at either 9 and 15 hour or 8and 16 hour daily interval produce 1 to 3 percent less milk per lactation than cows milked at equal interval(G.C.Banerjee,1998) and also other study reported that milking interval(time between milking) should be equal(James R.,2003)

4.2.2.2 The effect of incomplete milking on milk yield

According to the result of this study incomplete milking had effect on milk yield and the milkier knows the effect of incomplete milking on milk yield. In complete milking causes mastitis and reduced milk yield. other study also reported that incomplete milking affected the milk yield, cause

mastitis and drying of cow (William J .A and R.Trevor,1999). complete milking has to be done otherwise the residual milk may act as a breeding place for organisms responsible for mastitis(G.C.Banerjee,1998) When cows are mistreated or unduly disturbed or excited just before or during milking, adrenaline may be released in to the blood, stream by the adrenal gland, this hormone inhibits the effect (action of oxytocin and stops milk let down ,this reaction can cause incomplete milking, udder problem and reduced milk yield(Richard A.,2007).

4.2.2.3 The effect of milking speed on milk yield

The milking speed effect on milk yield was analyzed by compared the mean milk yield that was milked by slow milkier and the mean milk yield that was milked by fast milkier. The result showed there were significant ($p<0.0007$) difference between the mean milk yield that were milked by fast milkier and the mean milk yield that were milked by slow milkier. According to the result of the study the slow milkier takes 9 minutes to milked the cow and the fast milkier takes 7 minutes to finish milking but the cow remained stimulated for 7 to 8 minutes .according to the report of William and Paul (1978).when milking time is greater than 8 minutes the stimulation stops and oxytocin are inhibited by adrenal hormone ,because continual over milking can be irritating and painful, that cause the release of adrenalin hormone completely blocks the action of oxytocin (falvey and chantalakhand,1999). When the cow milked for long period of time the milk yield becomes reduced because continual over milking can be irritating and painful to the cow, which may the release of adrenaline, so the action of adrenaline can neutralize the effect of oxytocin by constricting blood vessels, which reduces blood flow and oxytocin presence in the udder (William and paul, 1978). The effect of oxytocin is diminished in about 7 minutes, so rapid milking is necessary if one is to obtain a complete emptying of the udder (Richard A., 2007). The stimulation of udder lasts for a limited time only(less than one minute) since oxytocin is destroyed in the blood stream very fast, hence , once the let down has occurred, it is important that the milk be removed with in approximately 5 to 7 minutes to obtain the greatest amount(G.C.Banarjee,1998).

5. Conclusion and Recommendation

5.1 conclusion

In this study the mean milk yield of three times milking per day were greater than the mean milk yield of two times milking per day both in low producing cows and in high producing cows. Milking speed also significantly affected the milk yield and the mean milk yield that were milked by fast milkier and

the mean milk yield that were milked by slow milkier were compared. In general, this study indicated that the effect of three times milking per day had greater effect on milk yield in UOG dairy farm as compared to other study. According to the result of this study the three times milking per day had significant ($p<0.0001$) effect on milk yield and also the milking speed show significant ($p<0.0007$) effect on milk yield. The mean milk yield of milking frequency and milking speed were analyzed by using independent sample t-test.

5.2 Recommendation

In order to improve the production performance both low and high cows the milkier should understand the effect of milking practice and milking frequency on milk yield. The following recommendation is forward. The milkier should not be talk loudly and do not hit the cow during milking.

-The milkier should be wash the udder properly by using warm water

-They should be milked three times per day to increase milk yield.

-The farm manager should be employed fast milkier to increase the milk yield of the cow because milking speed affected the milk yield.

-The cow should be protected from flies during milking.

-The milk recorder should be record and measured the milk yield during milking properly.

-The UOG dairy farm should employed adult milkier because age affects the speed of milkier during milking and their knowledge becomes reduced.

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7. Appendices

1.Does the total milk production of the farm vary from day to day?

Yes ☐ No ☐

2.If your answer for question number 1 is yes, what do you expect the cause would be?

a----------

b-_____

c._____

d._____

3.Does the total milk yield of individual cow vary from day to day

Yes ☐ No ☐

4.If your answer for question for question number 3 is yes? What would be the reason?

A,----------

B,----------

C,----------

D,----------

5.Are visitors allowed to visit the farmer students to practice in the farm at the time of milking

Yes ☐ No ☐

6.Do you know the effect of milking condition on milk yield

Yes ☐ No ☐

7.If your answer for question number 6 is yes? What are they?

A, _____

B,_____

C,_____

D,_____

8.Do you know the effect of milking frequency on milk yield

Yes ☐ No ☐

9.If your answer for question number 8 is yes, why not you increase them milk frequency to increase milk yield?

a,----------

a. ----------

10. Do you know the effect of milking speed on milk yield?

Yes ☐ No ☐

11. If your answer for number 6 is yes why do not you bring into play the conditions not to favour adrenaline secretion?

A,----------

B,----------

C----------

12, Do you know the effect of complete milking on milk yield?

Yes ☐ No ☐

13,If your answer for question 12 is yes How?

A,----------

B,----------

C,----------

D,----------

14,Do you completely milk the cows?

Yes ☐ No ☐

15,If your answer for question 14 is no why?

A,----------

B,_____

C,_____

D,_____

16,Do you milk the cow at regular time every day?

Yes ☐ No ☐

17,If the answer is no what is the reason?

A,_____

B,_____

C,_____

D,_____

18,Do you follow the correct milking order?

Yes NO

19.If your answer for No 18 is no what is the reason?

A,_____

B,_____

C,_____

D,_____

20. do you use milk let down stimulation?

Yes No

Work plan used

Work plan	**Time period**
Activities	
Collection and review of secondary data	February
Check list preparation	March, 2007
Exploratory survey	March 1-6, 2007
Compilation of preliminary results	March 6-10, 2007
Conducting detailed discussion with farmers	March 30, 2007
Preparing questionnaire for formal interview	April 1-5, 2007
Pre-testing questionnaire	April 5-10, 2007
Conducting the formal survey	April 10-12, 2007
Data entry and data analysis	April 12-15, 2007
Writing of the research	April 15-20, 2007
Submission of the research	April 20-25, 2007

Budget	**Unit price/Birr/**	**Total expenses**
Buying paper	100 birr	100 birr
Pencil	19 birr	19 birr
CD	6 birr	6 birr
Printing	100 birr	100 birr